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Introduction: Syncopated Sustainable Development (Sustainable Development, Agriculture, and the Challenge of Genetically Modified Organisms Symposium)

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Introduction

Syncopated Sustainable Development

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The articles that follow were prepared for a conference on *Sustainable Development, Agriculture, and the Challenge of Genetically Modified Organisms* that was sponsored by the Indiana University School of Law—Bloomington and the Indiana University Center for the Study of Global Change, pursuant to a grant from the U.S. Department of Education.[1] The goal of the conference was to give substance to the elusive concept of sustainable development by placing it in a global context. We asked what encouragement and what limitations sustainability places on the practices and institutions for the production and development of food for the world's people, focusing particularly on the use and ownership of genetically modified organisms (GMOs) and on the effects of modernization on local, indigenous industries and economies.

One of the most significant externalities attributed to globalization is the increasing difference in wealth between the industrialized countries of the North and the economic needs of the developing countries of the South. The awareness of this growing gap permeates international environmental policy and law, and it creates a fundamental tension between the environmental concerns of richer and poorer nations. For the industrialized world, environmental protection means modifying the production practices, and to some extent the economic aspirations, of their societies in order to protect their long-range well-being. It demands limitations on the means and pace of production. For the developing world, the pressing environmental problem is not over-development, but rather the absence of economic development. The horrors of poverty, war, disease, malnutrition, and starvation are immediate evils in themselves, and they contribute directly to environmental devastation in the developing world. As our keynote speaker Mark Sagoff puts it in his article, "The problem is that the Horsemen of the Apocalypse ride together. Where War and Pestilence are found, so are Famine and Death."[2]

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1. The conference was supported by an International Studies National Resource Center Title VI grant.

2. Mark Sagoff, *Biotechnology and Agriculture: The Common Wisdom and Its Critics*, 9 IND. J. GLOBAL LEGAL STUD. 13, 20 (2001).

Developing nations fear, further, that limitations on development will simply extend the legacy of imperialism and colonialism by entrenching and extending the existing relationship between a wealthy, industrial North and a poor, economically backward South. The approaches of North and South to international environmental protection do not merely differ; they contradict each other.

Since the work of the World Commission on Environment and Development (WCED) between 1983 and 1987, this contradiction has been mediated in international environmental law by the idea of "sustainable development."[3] Sustainable development "calls for economic growth that can relieve the great poverty of the less developed countries, based on policies that sustain and expand the environmental resource base."[4] In the words of the WCED, it "ensures that [humanity] meets the needs of the present without compromising the ability of future generations to meet their own needs."[5] The deliberate vagueness of the obligation to the future and the ambiguity of the relationship between development and environmental protection has served diplomatic purposes well, but it leaves the nature and extent of the obligation uncertain. The WCED was hazy on the central question of limits:[6]

> The concept of sustainable development does imply limits—not absolute limits but limitations imposed by the present state of technology and social organization on environmental resources and by the ability of the biosphere to absorb the effects of human activities. But technology and social organization can be both managed and improved to make way for a new era of economic growth.[7]

As a result, there are "hard" and "soft" versions of sustainable development. The hard version would impose real restrictions on the nature and extent of development in the name of sustainability.[8] The soft version treats sustainable development as a set of very general guidelines or goals, a position reinforced by

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3. *See* WORLD COMM. ON ENV'T & DEV., OUR COMMON FUTURE (1987) [hereinafter OUR COMMON FUTURE].

4. Lakshman Guruswamy, *International Environmental Law: Boundaries, Landmarks, and Realities*, NATURAL RESOURCES & ENVT., Fall 1995, at 43, 45.

5. OUR COMMON FUTURE, *supra* note 3, at 8, 43.

6. *See* A. Dan Tarlock, *Ideas Without Institutions: The Paradox of Sustainable Development*, 9 IND. J. GLOBAL LEGAL STUD. 35, 38 (2001).

7. OUR COMMON FUTURE, *supra* note 3, at 8.

8. John C. Dernbach, *Sustainable Development as a Framework for National Governance*, 49 CASE W. RES. L. REV. 1, 31-32 (1998) (calling it a "normative framework"); Tarlock, *supra* note 6 passim.

the essentially hortatory nature of the international instrument that first formally adopted it.[9]

Vagueness and ambiguity have also left the protective half of sustainable development highly vulnerable to erosion. Lakshman Guruswamy has observed that, in many ways, the United Nations Conference on Environment and Development in Rio de Janeiro, the so-called Earth Summit, represented a retreat from environmental protection.[10] This is evident from a comparison of the Stockholm Declaration of 1972[11] with the Rio Declaration of 1992.[12] Stockholm Principle 2 declared a "fundamental right to freedom, equality and adequate conditions of life, in an environment of quality that permits a life of dignity and well-being." Principle 21 recognized states' "sovereign right to exploit their own resources pursuant to their own environmental policies," subject to the obligation not to harm their neighbors. Rio Principle 1, in contrast, declares: "Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature." Principle 2 reworks Stockholm Principle 21 by recognizing states' "sovereign right to exploit their own resources pursuant to their own environmental and developmental policies." In short, Rio replaced a right to a healthy environment with a right to develop, and environmental protection was relegated to a distinctly secondary status: "In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process".[13] Sustainable development is now syncopated, with the emphasis on the second beat.[14]

The syncopation of sustainable development has coincided with the globalization of the world's economies and societies. Globalization is a widely used term that refers to a multiplicity of external activities. We use the term to refer to flows of ideas, images, goods, services, and people that take place within an integrated whole, without regard to territorial or geographical boundaries and

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9. Rio Declaration on Environment and Development, adopted by the U.N. Conference on Environment and Development, June 13, 1992, 31 I.L.M 874 (1992) [hereinafter Rio Declaration]. Interestingly, the Rio Declaration treats sustainable development as a known concept and qualifies it in important ways. *See, e.g., Id.* princs. 1, 5, 9, at 876, 877.

10. *See* Guruswamy, *supra* note 4, at 46.

11. Stockholm Declaration of the United Nations Conference on the Human Environment, June 16, 1972, 11 I.L.M. 1416 (1972).

12. Rio Declaration, *supra* note 9.

13. Rio Declaration, *supra* note 9, princ. 4, at 877.

14. *Cf.* Mark Seidenfeld, *A Syncopated* Chevron: *Emphasizing Reasoned Decisionmaking in Reviewing Agency Interpretations of Statutes*, 73 TEX. L. REV. 83 (1994) (arguing for greater attention to the second half of *Chevron*'s two-step analysis).

often without the direct agency of the state.[15] The increasing and seemingly irreversible interconnection and interdependence that these flows can trigger has enormous potential to bring greater development, but the role of sustainability remains to be seen. The recent rise in influence of the General Agreement on Tariffs and Trade (GATT), and the World Trade Organization (WTO) that administers it, offers a cautionary tale.[16] Article XX of the GATT clearly places the burden of justification on any "non-tariff trade barrier," including environmental protection measures, and WTO dispute resolution panels have consistently interpreted article XX to permit only very limited environmental barriers to full free trade. More importantly, these panels have limited their analysis of trade disputes to the GATT and subsidiary agreements, refusing to consider the obligations of international environmental treaties and customary law in their rulings. To the extent that the WTO represents globalization generally, critics charge that it imposes globalization on multinational business' terms. Clearly, a broader, more democratic vision of globalization is needed.[17]

The international commitment to the environmental protection element of sustainable development has eroded because, in this era of globalization, "sustainable development" has not yet advanced beyond being a form of words designed to achieve a political compromise. If sustainable development is to flourish as a means of providing a healthy environment for future generations, it must have real content and meaning—conceptual, technological, financial, and legal—for a global economy and society. The conference explored this question in relation to food crops and agriculture.[18] The specific challenge of the conference was to determine what the ambiguous or even contradictory idea of sustainable development means for the hotly debated topic of GMOs in agriculture. By indicating in the passage quoted above that sustainable development imposes limitations under *current* technological and social

15. Jost Delbruck, *Globalization of Law, Politics, and Markets Implications for Domestic Law: A European Perspective*, 1 IND. J. GLOBAL LEGAL STUD. 9 (1993); Alfred C. Aman, Jr., *The Globalizing State: A Future-Oriented Perspective on the Public/Private Distinction, Federalism, and Democracy*, 31 VAND. J. TRANSNAT'L L. 769 (1998).

16. *See* Lakshman Guruswamy, *The Promise of the United Nations Convention on the Law of the Sea (UNCLOS): Justice in Trade and Environment Disputes*, 25 ECOLOGY L.Q. 189, 197-206 (1998); Vern R. Walker, *Keeping the WTO from Becoming the "World Trans-Science Organization": Scientific Uncertainty, Science Policy, and Factfinding in the Growth Hormones Dispute*, 31 CORNELL INT'L L.J. 251 (1998).

17. *But see* Robert Howse, *Democracy, Science, and Free Trade: Risk Regulation on Trial at the World Trade Organization*, 98 MICH. L. REV. 2329 (2000) (arguing that WTO review strengthens democratic deliberation).

18. The symposium did not, by and large, address agricultural animals. For a discussion of the ethical issues of genetic modification of animals, see generally BERNARD E. ROLLIN, THE FRANKENSTEIN SYNDROME: ETHICAL AND SOCIAL ISSUES IN THE GENETIC ENGINEERING OF ANIMALS (1995).

conditions, the WCED was suggesting that technology is a way to avoid the question of limits. Are GMOs just what the WCED had in mind with new technologies, that is, a way to increase the productivity of existing farmland while reducing dependence on fertilizer and pesticides? Or, are they "Frankenstein foods" that hold the potential for environmental catastrophe? The United Nations plans an Earth Summit 2002 to evaluate progress toward sustainable development in the decade since Rio, and GMOs will surely be a major topic of discussion.

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The lead article, by Mark Sagoff, challenges us to move beyond the common conception that genetic modification represents a terminal break with nature.[19] It does in fact do so, he argues, but that die was cast long ago. We no longer live in a natural world in any meaningful sense of the term, and we would have enormous difficulty living in such a world. Instead of concentrating on the unnaturalness of genetically modified (GM) technology, therefore, Sagoff suggests that we consider the distribution of supply and demand for agricultural products. In this area, the conventional wisdom may have it exactly wrong. GMOs are most problematic in the industrialized world, where GM technology, like other agricultural technologies that have gone before it, create a "treadmill" of increasing production at decreasing prices, resulting in "glut, glut, and more glut." For the developing world, by contrast, GMOs may have strikingly beneficial effects, at least on a local basis.

The remainder of the conference explored sustainable development and GMOs in three stages. The first panel, *Sustainability, Agriculture, and GMOs*, introduced the issues by examining the relationships among sustainability, modernization, globalization, international environmental and trade law, and modern agriculture through the lens of GMOs. Dan Tarlock's article identifies the components of what we have called a hard version of sustainable development.[20] While sustainable development has been enthusiastically adopted by much of the world as the standard for judging environmental and development policy, there are no institutional structures in place to implement the limitations and obligations essential to achieving real changes in the quality and quantity of consumption.

19. Sagoff, *supra* note 2, at 13.

20. Tarlock, *supra* note 6.

David Pimentel reviews the role of pesticides in providing a nutritionally adequate food supply.[21] Conventional pesticides are essential to reducing crop losses, but their application is extremely inefficient and highly damaging to human health and the environment. In this sense, GMOs should be treated like other pesticides. They have great potential benefits, but they pose some of the same dangers as conventional pesticides and they pose some new risks of their own. In view of the substantial known dangers of conventional pesticides, the potential utility of genetically modified plant-pesticides should not be overlooked, but neither should they be too readily embraced.

Ellen Messer argues that GMOs have great potential to address the serious nutritional deficiencies from which much of the world's population suffers, but they will reach this potential only if the right varieties are created and deployed in the right places.[22] Unlike the original Green Revolution, the GMO revolution is not led by public or public-regarding research institutions. Instead, it is driven by private investment, leaving the technology largely in the hands of large, profit-oriented enterprises. This not only skews research and development toward the more profitable varieties (which emphatically do not include subsistence crops), but the control of the technology through intellectual property law limits the ability of others to engage in subsistence-oriented research.

A second panel, *The Promise and Peril of Intellectual Property in GMOs*, then examined the relation of sustainability to GMOs and what David Conway has called the "Doubly Green Revolution."[23] As Messer suggests, the ownership of GMO technology will have profound effects on the availability of GMOs in developing countries and on the distribution of wealth between North and South. Availability and wealth distribution are intimately connected to the sustainability of agricultural systems, so the panel addressed the interrelationships among intellectual property, GMOs, and sustainability.

Mark Janis examines two patent doctrines—subject matter eligibility and the experimental use defense—to determine whether they might be candidates for using intellectual property law to further the aspirations of sustainable agriculture.[24] Tightening subject matter eligibility may at first appear to be a way

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21. David Pimentel, *Overview of the Use of Genetically Modified Organisms and Pesticides in Agriculture*, 9 IND. J. GLOBAL LEGAL STUD. 51 (2001).

22. Ellen Messer, *Are GMOs the Best Way to Ensure Nutritionally Adequate Food?: Food System and Dietary Perspectives*, 9 IND. J. GLOBAL LEGAL STUD. 65 (2001).

23. GORDON CONWAY, THE DOUBLY GREEN REVOLUTION: FOOD FOR ALL IN THE 21ST CENTURY (1997).

24. Mark D. Janis, *Sustainable Agriculture, Patent Rights, and Plant Innovation*, 9 IND. J. GLOBAL LEGAL STUD. 91 (2001).

to force sustainability innovation into the public domain, but in fact, Janis finds, such a move will only divert innovation to areas where intellectual property protection *is* available, and those areas may not be of any value for sustainable agriculture. Expansion of the experimental use defense, on the other hand, holds real promise for facilitating innovations in GM technology that will serve the goals of sustainability, though it will require significant changes in existing patent jurisprudence that has interpreted the defense virtually out of existence.

It is not at all clear, argues Yvonne Cripps, that biotechnology will materially assist in furthering sustainable development, because intellectual property rights are held almost exclusively by profit-oriented institutions whose willingness to allow discounted technology transfer to developing countries is inevitably limited.[25] For her, the important issues are the limitations on biotechnology that are needed to prevent particular abuses made possible by GM technology. For example, what are the ethical implications of creating a "sustainable human" through genetic modification to improve phenotypes, to produce spare parts, to renew (i.e., clone) individuals, or to create hybrids (chimeras) of humans and other organisms? A different problem is posed by so-called biopiracy, in which genetic material is taken from a conventionally bred or wild plant, is refined or modified, and is then privately appropriated through intellectual property rights. The beginnings of protection for our common genetic heritage may be found in European and international trade law, but more is needed.

Stephen Brush is concerned with the social impacts of the diffusion of GMOs into the peasant sectors of less developed countries.[26] Brush finds that the evidence for negative effects of the Green Revolution on small-scale farmers is contradictory and unpersuasive. Therefore, to the extent that the Green Revolution is a model for the social impacts we can expect from GM technology, it offers little reason to oppose such developments. The more important concern is equity in the flow of genetic resources from poor to industrial countries and the return of intellectual property-protected GM products to the poor countries. Brush suggests that the frequently advocated solution of creating intellectual property rights in indigenous peoples will create more problems of access than it will solve, by disrupting local practices that in the past have allowed for wide

25. Yvonne Cripps, *Patenting Resources: Biotechnology and the Concept of Sustainable Development*, 9 IND. J. GLOBAL LEGAL STUD. 119 (2001).

26. Stephen B. Brush, *Genetically Modified Organisms in Peasant Farming: Social Impact and Equity*, 9 IND. J. GLOBAL LEGAL STUD. 135 (2001).

diffusion of such knowledge within indigenous communities and to public-oriented research institutions.

Ikechi Mgbeoji believes that the misappropriation of traditional knowledge of the uses of plants (TKUP) calls for the creation of a communal patent system under local legislative control.[27] Mgbeoji also offers an extensive critique of existing international intellectual property law as dominated by largely mythical notions of individual creation of ideas and of globally absolute criteria for novelty. Instead, he proposes a framework for treating plant-related patents that mirrors the present revolution in thinking about the underlying principles of patent law. His central thesis is that local communities can legitimately exploit the current patent system's malleability to protect bio-cultural knowledge. This approach may help ensure that local and traditional communities receive a fair bargain in the commercialization of their knowledge.

The third panel, *Legal Regimes for Advancing and Controlling GMOs*, examined the relationship of the concept of sustainability to non-property legal regimes. Stephen Tromans highlights the dilemma for the United Kingdom (UK) and European Union (EU) regulatory systems posed by GM technologies with large, but largely potential, benefits and large, but largely undefined, harms.[28] The UK requires governmental consent to releases of GMOs, based on the provision of information and a risk assessment. The EU directives on contained uses of microorganisms and on deliberate release of GMOs are more administratively onerous, and they elevate disputes to a high political level. The newest GMO directives are even stricter, and even they are not enough for some Member States. Several EU members have taken advantage of the "safeguard procedure" in existing law, which allows individual Member States to refuse consent to GM products, in derogation of the general principle of common markets that acceptance in one State requires acceptance in all. Tromans emphasizes the need for internationally harmonized procedures for approval of GM technologies.

Addressing the problem of harmonization, John Applegate traces the gulf between the European and the United States legal regime for GMOs to two fundamentally different narratives—"Frankenstein" and "Better Living Through Chemistry," respectively—that structure their respective understandings of the

27. Ikechi Mgbeoji, *Patents and Traditional Knowledge of the Uses of Plants: Is a Communal Patent Regime Part of the Solution to the Scourge of Bio Piracy?*, 9 IND. J. GLOBAL LEGAL STUD. 163 (2001).

28. Stephen Tromans, *Promise, Peril, Precaution: The Environmental Regulation of Genetically Modified Organisms*, 9 IND. J. GLOBAL LEGAL STUD. 187 (2001).

phenomenon.[29] The narratives structure the regulatory systems that apply to GMOs, presenting the would-be harmonizer with the need to bridge a substantial gap. Applegate recommends the use of the precautionary principle, supported by its own "Prometheus" narrative of innovation and caution. Properly construed, this principle of international environmental law acknowledges the dangers of new technologies and the need for foresight to discern and respond to them, but it also recognizes that some risks can be avoided or minimized without forgoing all of the potential benefits.

The closing article by Aarti Gupta continues the theme of a lack of shared understanding of the effects of GMOs.[30] Gupta focuses primarily on the advance informed agreement (AIA) provisions of the Cartagena Protocol. AIA incorporates three decision criteria—sound science, the precautionary principle, and socioeconomic effects—but it clearly and strongly privileges traditional scientific methods. This has the effect of crowding out the other concerns, effectively ignoring both the normative (non-technical) issues raised by new technologies and the socioeconomic concerns that are at the heart of the developing world's opposition to GMOs. Gupta urges the development of AIA or other instruments that can anticipate harm from new technologies before they become irreversible and which explicitly acknowledge the relevance of social impacts to acceptance of such technologies.

Lakshman Guruswamy tackles the famously troubled relationship between trade and sustainable development.[31] Free trade is both a friend and an enemy of sustainable development. Free traders emphasize that the efficiency and prosperity that trade brings make sustainability possible. At the same time, the relaxation of trade restrictions encourages consumption-based economies and makes it difficult for individual states to maintain environmentally protective policies. Guruswamy views GMOs in much the same way: they may support sustainable agriculture by replacing material requirements (abundant water, fertile soil, a lengthy growing season) with information-based technologies, but they also pose dangers. He cautions against hasty action to foreclose the use of GMOs, in favor of a more moderated, risk-based regulatory scheme. From this perspective,

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29. John S. Applegate, *The Prometheus Principle: Using the Precautionary Principle to Harmonize Regulation of Genetically Modified Organisms*, 9 IND. J. GLOBAL LEGAL STUD. 207 (2001).

30. Aarti Gupta, *Advance Informed Agreement: A Shared Basis for Governing Trade in Genetically Modified Organisms*, 9 IND. J. GLOBAL LEGAL STUD. 265 (2001).

31 Lakshman D. Guruswamy, *Sustainable Agriculture: Do GMOs Imperil Biosafety*, 9 IND. J. GLOBAL LEGAL STUD. (forthcoming 2002). Professor Guruswamy's article will appear in the next issue of the *Journal*.

he concludes that the WTO system (specifically, the Agreement on Sanitary and Phytosanitary Measures) is a better way to manage GMOs than the Cartagena Protocol.

Kurt Buechle's note offers a spirited defense of the further development and deployment of GMOs.[32] He argues that on the whole the projected benefits of this technology far outweigh their largely speculative risks. The blanket opposition that characterizes much of the European and environmental reaction to GMOs is based, he argues, more on generalized fear than on good evidence of the likelihood of serious, unmanageable harms. Consequently, he urges that GMOs be regulated on a product-by-product basis, evaluating specific risks and benefits as we ordinarily do with new products of more familiar origin.

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Of the many themes that run through the conference articles, two seem to us to be of particular note. The first is the fundamental question whether GMOs are the same as or different from the products and processes of conventional selective breeding. The position one takes on this question has consequences for a variety of important issues. Several articles explicitly adopt pre-GM models (the technology treadmill, the Green Revolution, and so on) to analyze the probable environmental, social, and economic effects of GMOs. Others emphasize the newness of the technology and the differentness of the problems that will be encountered. The fundamental difference in legal regimes can also be traced to this question. If we can use the past to predict the future effects of GMOs, then we can expect to be able to predict and manage what are largely familiar problems. Likewise, if GMOs are simply another in a long line of advances in agricultural technology, they should be viewed as part (and only a part) of ongoing efforts to improve agricultural productivity and human nutrition; that is, GMOs should be part of the effort to achieve sustainable development. If, on the contrary, they represent a "new species of trouble,"[33] then the adequacy of current legal regimes—from food safety to species protection to toxic substances control to intellectual property—must be reconsidered. Until this fundamental conflict in our understanding of GMOs is resolved, their regulation will pose

32. Kurt Buechle, *The Great Global Promise of Genetically Modified Organisms: Overcoming Fear, Misconceptions, and the Cartagena Protocol on Biosafety*, 9 IND. J. GLOBAL LEGAL STUD. 283 (2001).

33. KAI ERICKSON, A NEW SPECIES OF TROUBLE: EXPLORATIONS IN DISASTER, TRAUMA, AND COMMUNITY (1994).

exceptionally difficult problems for national and international governance structures.

The second theme flows from another way in which GMOs are a new, or at least modern, phenomenon. Having been developed in a globalized world, they are independent of much of the traditional, State-based sponsorship and control that has characterized previous agricultural innovation, yet they are subject to control by layers of national and international organizations, both public and private. For several of the conference participants, this was central:

> The main issue is not whether GMOs will or will not reduce pollution and pest damage or enhance production with greater economies of scale, but who will make the decisions on what crops and cropping methods will be promoted and available. By leaving the choices to the private sector, governments remove incentives for anyone to work on poor people's crops. . . .[34]

The GMO problem, in other words, is not technically resolvable. The important questions are not science or calculated risks and benefits, but rather how we want to live in the world. Should we be surrounded by the landscapes and ecosystems of traditional farming or of industrial agriculture? How will the assets of the earth, both its original equipment and the products of technical innovation, be allocated, especially between richer and poorer nations?

Both themes end in questions and not answers, and that is perhaps a fitting way to introduce a conference on sustainable development. Sustainable development demands a complex and multi-faceted inquiry. The question of sustainability cannot be separated from the question of what kind of world is to be sustained. In this sense it parallels globalization: the question is not whether the world will globalize, but what kind of globalized world we want. If the danger for globalization is that it will take place on terms dictated by the interests of private, profit-driven enterprises, the danger for sustainable development is that it will be syncopated, with economic development dominating the questions—addressed in the articles that follow—that comprise sustainability.

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34. Messer, *supra* note 21, at 87.